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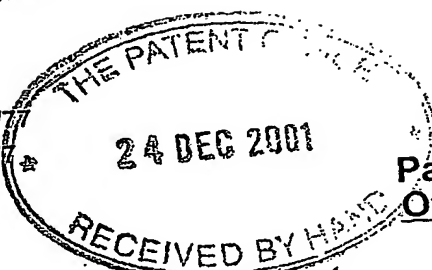
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Dated 20 January 2003

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The  
Patent  
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F01/7700 0.00-0130936.8

24 DEC 2001

# Request for grant of a patent

The Patent Office  
Cardiff Road  
Newport  
South Wales NP10 8QQ

1. Your reference 1869701/DJBB

2. Patent Application Number

0130936.8

3. Full name, address and postcode of the or of each applicant(underline all surnames)

Scientific Generics Limited  
Harston Mill  
Harston  
Cambridgeshire  
CB2 5GG

7970296002

Patents ADP number (if known)

If the applicant is a corporate body, give the  
country/state of its incorporation

Country: ENGLAND

4. Title of the invention  
SIGNALLING SYSTEM

5. Name of agent

Beresford & Co

"Address for Service" in the United Kingdom  
to which all correspondence should be sent

2/5 Warwick Court  
High Holborn  
London WC1R 5DH

Patents ADP number

6. Priority details

1826001

Country

Priority application number

Date of filing

# Patents Form 1/77

7. If this application is divided or otherwise derived from an earlier UK application give details

Number of earlier application

Date of filing

8. Is a statement of inventorship and or right to grant of a patent required in support of this request?  
Yes

9. Enter the number of sheets for any of the following items you are filing with this form.

Continuation sheets of this form

Description

Claim(s)

Abstract

Drawing(s)

4

JmC

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents form 7/77*)

1 + 2 copies

Request for preliminary examination and search (*Patents Form 9/77*)

Request for Substantive Examination (*Patents Form 10/77*)

Any other documents (*please specify*)

11. I/We request the grant of a patent on the basis of this application

Signature

Beresford & Co  
BERESFORD & Co

Date 24 December 2001

12. Name and daytime telephone number of person to contact in the United Kingdom

BRINCK; David John Borchardt

Tel: 020 7831 2290

## **Signalling System**

### **Summary**

The benefits of captioning systems for the hard of hearing are well understood. However caption systems can be costly and they often obscure part of the picture. This problem is particularly acute in cinemas. This invention makes use of standard mobile phones to receive, synchronise and display caption text.

### **Problem**

A significant proportion of the population with hearing difficulties benefit from captions on video images such as TV broadcasts, video tapes, DVD and movies. However, there are a number of problems with current solutions. With open captions systems where the text is displayed on screen it obscures part of the image. This presents a particular problem with cinema where there is a reluctance for this to happen with general audiences. It is also not possible to personalise content eg different languages. There are closed caption systems where the text is displayed on a separate screen. The problem with such a solution is that it adds additional cost and complexity and such systems have had poor take up in cinemas for this reason.

### **Invention**

This invention uses widely available phone and hand-held computers as the caption display device. The invention relates to how these can be used to successfully display captions that are accurately synchronised to the video/picture content.

### **Caption text**

The caption text can be transmitted to the hand-held device either in advance of the programme content happening or simultaneously with the content.

If it is done in advance this can be achieved by well recognised methods such as transfer by memory card, cable, infra-red link or over a radio communications network such as the mobile phone network or a wireless LAN. The caption text can be stored on a database and made available via the Internet for download by the methods described above. The caption text would contain timecode related information that would be triggered during the programme using timer in the phone and/or with some form of external synchronisation.

Real-time delivery could be by similar methods but could include transmission of the text information in the audio of the content using a range of acoustic transmission techniques such as WO 98/32248. Other techniques include: simple amplitude and frequency modulation of tones, echo modulation, critical band encoding. Masking of the data sound can be performed using a variety of psycho-acoustic approaches. At the required data rate for real-time transmission it is likely that it may be obtrusive to listeners with normal hearing therefore performing the transfer in advance is advantageous.

### **Synchronisation**

Synchronisation of the text is important to ensure that it occurs at the right point in the programme content. It is particularly important when the captions are loaded on to the hand-held device in advance. The captions could be started by the user pressing a button and button based control could be provided to adjust the synchronisation during the programme. Once initiated synchronisation would be maintained by using a timer in the device that triggers the captions based on related timing information associated with the text. This has the advantage of being simple but requires obvious cues that a deaf person can interpret. It also suffers from potential clock drift between the source and the timer in the device. A better solution is to provide cues directly to the device. This can be done by embedding synchronisation cues in the audio of the programme content. These can be decoded by using a microphone and processor found in digital mobile phones. Embedding cues only, rather than the text requires a significantly lower data rate and can be inserted at convenient points where the audio will mask them. The techniques for this are similar to those described above for transmission of the caption text.

The synchronisation codes used can either be the same code repeated whenever the synchronisation is required or it can be a unique code at each synchronisation point. The advantage of having a unique code at the synchronisation point is that a user who enters the film or requires the captions only at certain points (for example a user who can only rarely require the language translation captions) can start captioning at any point during the film. This is completely in the control of the user in this method.

It is envisaged that the synchronisation codes will only be required every minute or so in a preferred deployment. This results in very low obtrusiveness of the synchronisation codes. For lower power consumption in the hand held device it is possible to set up the hand held device so that it knows when to expect the synchronisation code approximately if it has downloaded the text and synchronisation choreography prior to the code being transmitted. For example, when a user enters a cinema they start the captioning option on their hand held device. The hand held device listens continuously for a synchronisation code until it receives one. The hand held device can then start the captioning from the point which corresponds to that particular synchronisation code (either the beginning or if it is a unique code then the unique point in the film that that corresponds to). The hand held device knows approximately when to expect the next synchronisation code (from the synchronisation choreography previously downloaded) and so it can save power by switching off the listening mode until a time window around the expected synchronisation point. This time window can be defined by the manufacturer of the hand held device or the user. This allows the hand held device to check its synchronisation with the film every minute or so in a low power mode.

To those skilled in the art it is possible to extend this text captioning to audio captioning. For example, the portion of the population who are visually impaired would benefit from additional information about what is happening on the screen. This cannot be delivered through a textual interface but could be delivered through the audio channel of the hand held device. The synchronisation and source of the audio captioning would be the same as that for the text captioning and can be downloaded prior to viewing. The user would then put earphones on during the show so that they can receive the extra information. This could also be used to transmit a different

language if the film has been dubbed so that each listener in the cinema could have their preferred language playing.

Other solutions for cues using a radio network such as a Wireless LAN or Infra-red could also be used. Cues could also be taken from the video content.

#### **Display**

The display could also be performed using 'head-up display' principles and equipment to enable the viewer to see the content and the captions simultaneously.

#### **Personalisation**

One of the advantages of using a hand-held device is that the caption content can be varied on an individual basis. For example different languages or additional information eg the directors comments or the names of the actors in a film.

#### **Applications**

Other applications include captioning for radio, TV, recorded media, opera, theatre, public presentations.

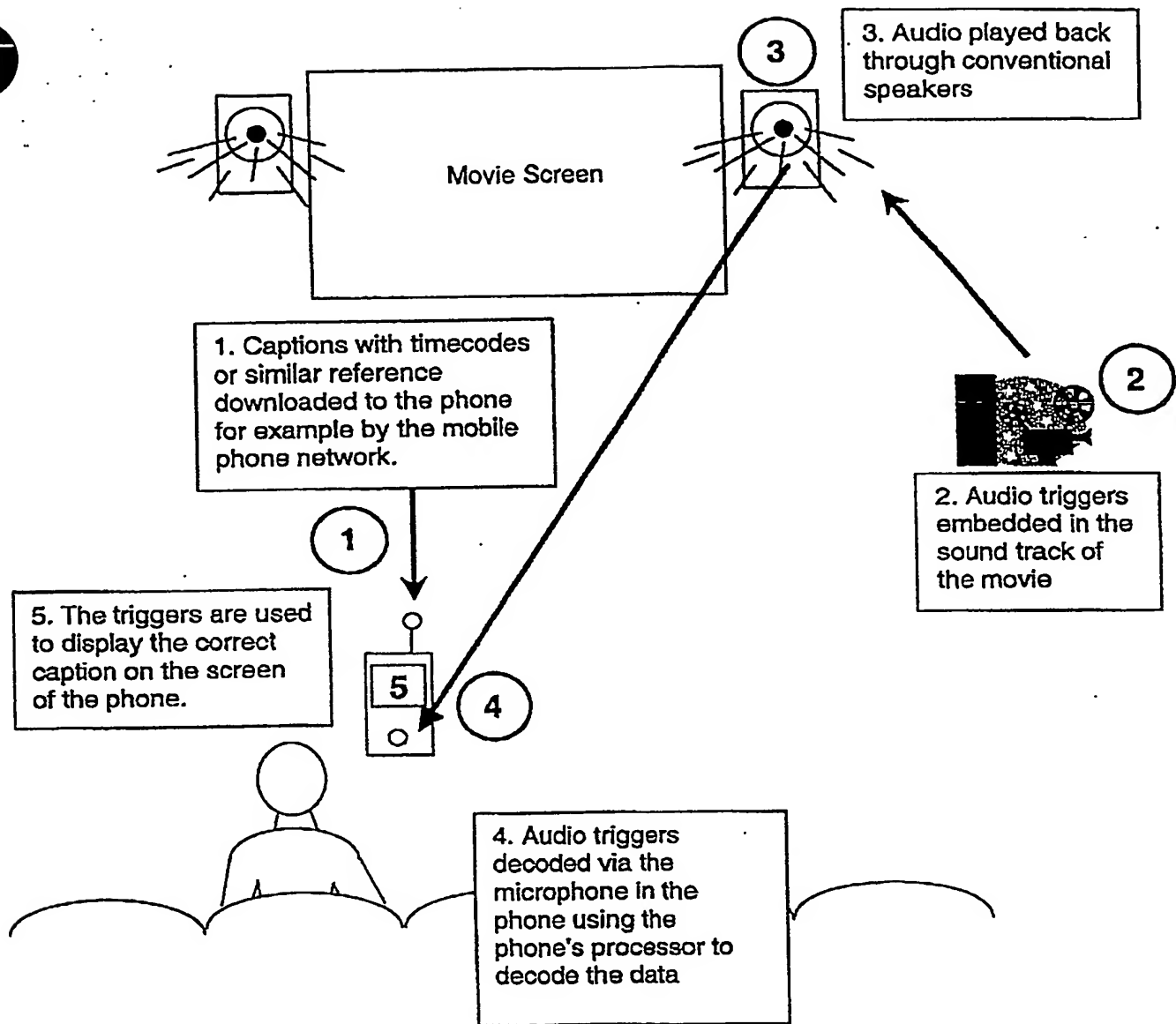
The contents of the following related applications are incorporated herein by reference:

WO 98/32248

WO 01/10065

International Application No. PCT/GB01/05300

International Application No. PCT/GB01/05306



A schematic outlining a system for closed captioning in cinemas using a mobile phone for the download of caption text, decoding of acoustic synchronisation signals and display of the caption text.